

Exam Code: 225003

Paper Code: 3223

Programme: Master of Science (Zoology) Semester III

Course Title: Research Techniques and Methodology

Course Code: MZOL-3481 ✓

Time Allowed: 3 Hours

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 14 marks.

Section-A

- Q1) (a) Discuss the various types of rotors used in Centrifugation. 7
 (b) What do you mean by Sedimentation coefficient? How it can be determined for subcellular fractions. 7
 Q2) Compare and contrast between Affinity Chromatography and Ion exchange Chromatography. 14

Section-B

- Q3) Give an account of the NMR Spectroscopy and its applications. 14
 Q4) Explain briefly-
 (a) Fluorescence Resonance Energy Transfer microscopy 7
 (b) Patch clamp 7

Section-C

- Q5) Explain the General principles and Support media for Electrophoresis. 14
 Q6) Write short notes on-
 (a) Capillary electrophoresis 7
 (b) Electrophoresis of Nucleic Acids 7

Section-D

- Q7) Explain in brief-
 (a) Solid and Liquid Scintillation 7
 (b) Geiger Muller tube 7
 Q8) Describe the various safety rules in the radio isotopic studies. 14

Exam Code: 225003

Paper Code: 3224

Programme: Master of Science (Zoology) Semester III

Course Title: Developmental Biology - I

Course Code: MZOL-3482

Time Allowed: 3 Hours

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 14 marks. Support your answers with suitable diagrams wherever necessary.

Section - A

- Q1. Describe the process of Oogenesis with the help of well labelled diagrams. 14
- Q2. Write detailed notes on
- a) Embryo Transplantation 7
 - b) Fast and slow block of polyspermy 7

Section - B

- Q3. Describe various types and patterns of cleavage and also discuss its characteristics. 14
- Q4. Explain the following with suitable diagrams & illustrations-
- a) Morphogenetic Movements 7
 - b) Diploid Parthenogenesis 7

Section - C

- Q5. Discuss the following-
- a) Compare and contrast autonomous and conditional specification, giving examples of organisms or cells that follow each pathway. 7
 - b) Explain syncytial specification and its unique aspects in organisms like *Drosophila*. 7
- Q6. Describe the determination of early embryonic induction. 14

Section - D

Q7. Describe post-translational regulation of gene expression and its importance in development. Explain how post-translational modifications affect protein activity, stability, and function, and provide examples of how these modifications contribute to developmental processes. 14

Q8. Describe how enhancers, silencers, and other regulatory elements control gene expression in specific cell types. 14

Exam Code: 225003

Paper Code: 3225

Programme: Master of Science (Zoology) Semester III

Course Title: General Biochemistry

Course Code: MZOL-3483

Time Allowed: 3 Hours

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 14 marks. Write legibly and draw well labelled diagram wherever necessary.

Section-A

- Q1) Discuss in detail the Michaelis-Menton kinetics for enzymatic activity. 14
- Q2) Explain in detail-
- (a) Energy mechanics of enzymatic reactions 7
- (b) Modifiers of Enzyme activity 7

Section-B

- Q3) (a) Explain the fates of Glycolysis. 7
- (b) Discuss the Mechanism of Gluconeogenesis. 7
- Q4) Describe the biochemistry and biological significance of Pentose phosphate pathway. 14

Section-C

- Q5) Write short notes on-
- (a) Regulation of citric acid cycle 7
- (b) Glyoxylate cycle 7
- Q6) Explain in detail the reactions of citric acid cycle. 14

Section-D

- Q7) Explain in brief-
- (a) Shuttle System in Mitochondria 7
- (b) Regulation of oxidative phosphorylation 7
- Q8) Discuss the mechanism and energy output of the β -Oxidation of fatty acids. 14

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Paper Code: 3226

Programme: Master of Science (Zoology) Semester III

Course Title: Applied Zoology-II (Vertebrates)

Course Code: MZOL-3484

Time Allowed: 3 Hours

Max. Marks: 70

Note: Attempt five questions in all, selecting at least one question from each section. Fifth question can be attempted from any section. Each question carries 14 marks. Draw neat and well labelled diagram wherever required.

Section - A

1. Describe economically important species of fresh water fishes. 14
2. Write a note on products and by products from poultry. 14

Section - B

3. Write a note on Fur producing animals. 14
4. explain processing of wool in detail. 14

Section - C

5. Write a note on milching breeds of cow. 14
6. Explain following.
 - a) Animals of leather industry 3
 - b) Tanning process 11

Section - D

7. Write a note on important breeds of swine. 14
8. Explain following pharmaceuticals and vaccines obtained from animals:-
 - a) Pharmaceuticals from animals 9
 - b) Vaccines from animals 5